DRAFT

MEMORANDUM FOR: Executive Director-Comptroller

SUBJECT : Interface Between the KY - 3 (Green) Telephone System and the CIA - NSA (Gray) Telephone System

REFERENCE : Memorandum dated 6 January 1967 to D/PPB from Executive Director-Comptroller, same subject

1. The attached report is in response to the reference memorandum.

2. This study was prepared by Messrs. [redacted]s, SPINT; 25X1A
25X1A [redacted], O/C; and [redacted], O/PPB. You will note that the 25X1A
report examines the overall secure voice problem as it affects the Langley building and not just the interconnection of the gray and green telephone systems as you requested. This approach was necessary to determine the proper relationship of the interface to future problems associated with the Agency's secure voice network.

3. The study has been coordinated with the Deputy Director for Support and the CIA SIGINT Officer who have concurred in the recommendations.

[redacted] 25X1A
Director of Planning,
Programming and Budgeting

Attachment

DRAFT

Problem

1. To provide recommendations with alternatives for the interface of the CIA KY - 3 (green) telephone system and the CIA - NSA (gray) telephone system, considering budgetary, technical, security, and cost-effectiveness aspects.

Assumptions

2. As other U.S. officials are provided with more and more secure voice by their organizations, we anticipate that there will be an increasing demand for similar service by Agency officials. It is assumed, therefore, that the secure voice usage within the CIA will grow over the next five-year period from approximately 500 lines of service to a minimum of 1,000 lines, and in all probability will reach 1,500 lines in five to ten years. Almost any growth beyond 600 lines will automatically require a new system of hardware.

Facts Bearing on the Problem

3. One of the U. S. Communications Security Board (CSB) priority objectives is to encipher all official communications, both record and voice. Much progress has been made over the past six years in the record communications portion of our system with the introduction of on-line cryptography. With more recent improvements in secure voice

technology, the overall objective of the CSB for enciphering voice communications is now attainable for the first time.

4. There are at present two secure voice systems used by the CIA in the Washington area which are capable of handling all categories of classified information: the gray phone system and the KY - 3 network or green system.

5. The gray phone system has been in operation for a number of years and is designed to provide secure phone service to the COMINT community. Physical protection is afforded so that only COMINT cleared persons have access to the telephones. The system consists of the following:

NSA

CIA Hqs.

NPIC

State

Pentagon

[redacted]

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The gray phone system at present handles approximately 300 phone calls per day between CIA and Ft. Meade -- 200 from Ft. Meade to CIA and 100 from CIA to Ft. Meade. Overall direction and control is the responsibility of NSA. CIA purchased the hardware for its part of the system. The sponsor within CIA is the CIA SIGINT Officer.

6. The other secure voice system is the KY - 3 network or green system, which is part of the National Communications System automatic secure voice communications network (AUTOSEVOCOM). AUTOSEVOCOM is now in its embryonic stage and consists of numerous switches in the Washington area. Planning is still not firm but the following orders of magnitude are currently envisioned as initial levels of service prior to the end of FY 1968:

CIA

Pentagon

State

NSA

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For this network, CIA now leases a switch from the Bell Telephone Company, located in the Langley Building within the telephone switching area on the first floor. Approximately 80 CIA subscribers are now served by this system. Maintenance of the switch is the responsibility of the Bell System and is paid for as part of the leased cost of the system. The sponsor within CIA is the Director of Communications.

7. The present gray phone system is not compatible with the green system in two technical particulars. First, the gray phone instruments do not have the voice frequency range necessary to operate the voice coders which are used for overseas service; secondly, the NSA gray phone system uses only two wires for each instrument, while the

green system uses four wires. This latter incompatibility can be surmounted in CIA by designing a special interfacing switch to interconnect the gray and green master switches.

8. Related to the above are future requirements for overseas service. The Departments of Defense and State have programs which will provide via the green phone system secure voice service for all U.S. Government officials, including CIA officials to specified overseas locations. These facilities, available now to a very limited degree, will be expanded in FY 1969 to a larger number of overseas installations of interest to CIA officials. As new DOD and State switches are installed overseas, and country teams in embassies or CINC staffs are supplied with secure voice service, we anticipate that Agency officials will desire equivalent service in approximately the same time frame.

Discussion

9. It is desirable, both for economic and operational reasons, to reduce the number of secure voice instruments on any one user's desk to one instrument capable of both domestic and overseas secure voice service. The alternative of providing separate phone networks either to serve independent communities of interest or to provide individual point-to-point secure voice circuits results in increased costs and an almost chaotic technical maze of noninterconnectable systems.

10. There are two alternative techniques to be considered in meeting future secure voice requirements in the CIA Langley building. A chart showing a functional comparison of the two techniques is attached (Tab A).

a. Trunk line encipherment system. In this system the cryptographic equipment is used to encipher the trunk lines that leave secured areas. All of the lines within the building as well as the switch itself passes classified information without encipherment. The security depends on the physical protection which is afforded the subscriber lines, the instruments and the switching system. The NSA or gray phone system is an example of this type of secure voice.

b. Subscriber line encipherment system. In this system separate cryptographic equipment is used to encipher each subscriber line. This equipment is usually located near the subscriber instrument. The information is enciphered and deciphered at the source and passes through the subscriber lines, the switch and the trunking line portion of the system in a form that requires no physical protection. The KY - 3 or green system is an example of this type of secure voice.

11. With regard to the problem of the best future system for CIA, Tab B compares the estimated costs of the two different systems described above. In reviewing this chart, it is evident that the trunk

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elsewhere in CIA at a saving of $7,000 each. The total savings will far exceed the expenditure for the interface.

Conclusions

13. The interface of the gray and green systems is essential to provide interim secure voice service for the next three years and funds should be provided in FY 1967 or early FY 1968 for this action.

14. The NSA request for CIA to replace the existing gray systems' ciphony and microwave trunk with a new T - 1 system should be answered affirmatively. CIA should program funds in FY 1969 to accomplish this.

15. Plans for a secure duct system for CIA Langley to accommodate secure telephone and data communications should be drawn up immediately.

16. The combining of both the present gray and green subscribers into one new trunk line encipherment system should be adopted as a future plan for meeting CIA secure voice requirements. As a corollary to this, the present KY - 3 green subscriber encipherment technique should be phased out in approximately four years. This corresponds to the end of the present terminal liability to the C & P Telephone Company for this system.

17. In 1970 work should begin to replace the gray phone system with a completely new system that is completely compatible with AUTOSEVOCOM. At that time, the direct connection between NSA and

CIA will be replaced eventually with the service to be supplied via the AUTOSEVOCOM switches.

Recommendations

18. CIA proceed with the interface of the Agency's gray and green switches for meeting interim requirements.

19. CIA modernize the present NSA/CIA trunk system.

20. The gray and green systems be combined and for future planning CIA adopt a single trunk line encipherment system in the Langley building to become operational in FY 1971.

Follow-on Actions

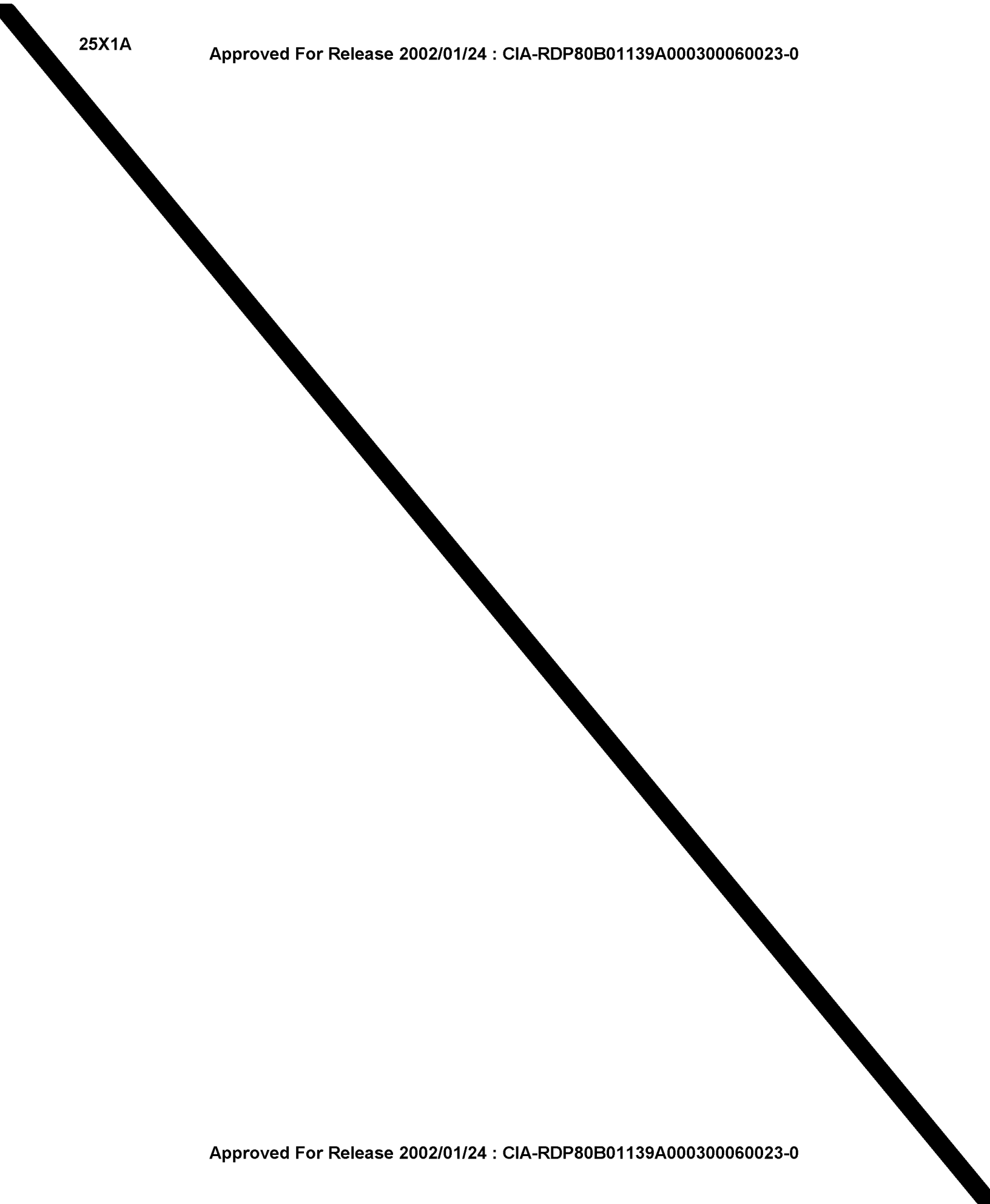
21. Upon adoption of the above recommendations, the following actions are required:

a. D/PPB make $80,000 to $100,000 available in FY 1967 or early FY 1968 for the interconnection of the gray and green systems. DD/S will then proceed with the interface.

b. The CIA SIGINT Officer or the DD/S program $130,000 in FY 1969 for upgrading the NSA - CIA trunk. The CIA SIGINT Officer, in conjunction with NSA, will carry out the upgrading.

c. The CIA SIGINT Officer write a letter to NSA announcing CIA's secure voice plans so that NSA can anticipate NSA customer requirements to be served off of the AUTOSEVOCOM network.

d. DD/S program for a new switch, provide space for the switch, sponsor a master Langley secure line system, and take over the management of both the gray and green subscribers secure voice service in FY 1971.



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